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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,920	03/02/2004	Albert A. Vierheilig	0113222-150	1426

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EXAMINER

HERTZOG, ARDITH E

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/790,920

Applicant(s)

VIERHEILIG ET AL.

Examiner

Ardith E. Hertzog

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/2 & 11/22, 2004; 6/13/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 20-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-28 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/22, 2004
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restriction

1. This action is in response to the "Response to Restriction Requirement" filed June 13, 2005: applicant's election of the invention of **Group I**, claims 1-19, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election **without** traverse (see MPEP § 818.03(a)). Thus, claims 20-28 are withdrawn from further consideration pursuant to 37 CFR § 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Priority

2. This application is a division(al) of application number 09/541,204 filed April 3, 2000, now US 6,812,189. Applicant's declaration **also** claims domestic priority under 35 U.S.C. § 119(e), based upon provisional application number 60/075,680 filed February 24, 1998. **However**, given that parent application 09/541,204 was filed later than twelve months after the filing of provisional application 60/075,680, this parent cannot claim the benefit of this provisional (see MPEP § 201.04(b)). Perhaps applicant **also** intends to claim priority under 35 U.S.C. § 120 of **intervening** application number 09/256,621 filed February 23, 1999, as was done in parent application 09/541,204.

3. **If so, then:** Specific reference to the earlier filed application must be made in the instant application. For benefit claims under 35 U.S.C. § 120, the reference must

include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications, which should appear as the first sentence(s) of the specification following the title, preferably as a separate paragraph, unless it appears in an application data sheet. The status of nonprovisional parent application(s) (whether patented or abandoned) should also be included.

4. **Furthermore:** If the application is a utility application filed under 35 U.S.C. § 111(a) on or after November 29, 2000, the specific reference **must** be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. See 37 CFR § 1.78(a)(2)(ii) and (a)(5)(ii). This time period is **not** extendable and a failure to submit the reference required by 35 U.S.C. § 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. § 119(e) and/or 120. **A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. § 119(e) and 120.** The petition must be accompanied by: (1) the reference required by 35 U.S.C. § 119(e) and 120 and 37 CFR § 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted); (2) a surcharge under 37 CFR § 1.17(t); and (3) a statement that the entire delay between the date the claim was due under 37 CFR § 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: "Mail Stop Petition, Commissioner for Patents,

P.O. Box 1450, Alexandria, Virginia 22313-1450". Note the corresponding discussion at the end of MPEP § 201.11 III. C.

5. **If not, then:** The effective filing date of the instantly examined claims is considered that of parent application 09/541,204—i.e., April 3, 2000.

6. **Accordingly, given the *current* record in this application, the effective filing date of the instantly examined claims must be considered that of parent application 09/541,204—i.e., April 3, 2000.**

Information Disclosure Statement

7. Receipt is acknowledged of the information disclosure statement (IDS) filed November 21, 2004. As the submission is in compliance with the provisions of 37 CFR § 1.97, the IDS has been considered, in accordance with the enclosed PTO-1449.

Drawings

8. The drawings are objected to, because Figure 1 should be designated by a legend such as "Prior Art", since only that which is old is illustrated. See MPEP § 608.02(g).

9. **Corrected drawing sheets in compliance with 37 CFR § 1.121(d) are required in reply to the Office action to avoid abandonment of the application.**

Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended". If

a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR § 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. **Any objection to the drawings will not be held in abeyance.**

Specification/Disclosure

10. The specification is objected to, because, in accordance with the discussion of priority *supra*, paragraph [0001] is written incorrectly. That is, applicant cannot currently claim "benefit of application U.S. Serial No. 60/075,680, filed on February 24, 1998". In addition, the status of parent application 09/541,204 should be updated. Appropriate correction is required.

11. The disclosure is objected to, because of the following minor informalities: In paragraph [0049], "the general formula MO" should evidently be revised as "the general formula MO-aluminate", for clarity, as well as consistency with the rest of the specification (see, for example, paragraphs [0030]-[0031]). Note the related 35 U.S.C. § 112, second paragraph, rejection which follows. Appropriate correction is required.

Claim Rejections - 35 U.S.C. § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claim 2 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claim is considered vague, indefinite, and/or confusing, because it recites "the general formula MO" for "the metal oxide-**aluminate** phase" (emphasis added). In accordance with the suggestion in paragraph 11. above, "the general formula MO" should evidently be revised as "the general formula MO-aluminate". Appropriate correction is required.

Claim Rejections - 35 U.S.C. §§ 102 & 103

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

15. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1-19 are rejected under 35 U.S.C. § 102(a) as clearly anticipated by WO 99/44201 (hereinafter "WO '201"). Initially, it is noted that this reference is currently available as prior art against the instant claims, since by only one of the instant inventors (i.e., "by others") and published August 26, 1999 (i.e., prior to 4/3/2000). See WO '201 claims 1-13, which appear *verbatim* to instant claims 1-13. See WO '201 claims 14, 20, 24 and 25, which appear, if not respectively *verbatim* to instant claims 14, 15, 18 and 19, then of basically the same scope; see also the WO '201 Examples. Note WO '201 claim 20 therefore encompasses the "fluid bed reactor" and "recirculated" limitations of instant claims 16-17 (since dependent upon instant claim 15); see also WO '201 claim 21.

17. Claims 1, 2 and 4-13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US 5,254,516 (Gupta et al., hereinafter "Gupta '516") in view of US 4,088,736 (Courty et al., hereinafter "Courty"). Gupta '516 teaches processes for removing reduced sulfur species in gaseous form, per instant claim 1, via zinc titanate-based sorbents (see Gupta '516 abstract). The Gupta '516 sorbents further comprise binder, per instant claim 7, and are attrition-resistant, spherically-shaped particles, per instant claim 8 (see col. 7, lines 29-46). Regeneration and recirculation steps, per instant claims 6 and 9-11, are taught by Gupta '516 (see col. 10, line 51 – col. 11, line 23, especially col. 11, lines 10-14), as are coal/hydrocarbon gas streams, per instant claims 12 and 13 (see col. 16, lines 62-65). Thus, Gupta '516 only fails to anticipate instant claims 1, 2 and 4-13, in that "a metal oxide-aluminate phase", per instant claim 1 (and thus the more specific "metal oxide-aluminate phase" requirements of instant

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claims 2, 4 and 5), are not disclosed within the zinc titanate-based sorbents. However, Gupta '516 does teach that, "[o]nly ZnO is the reactive component of the sorbent while TiO₂ provides stability to the sorbent by preventing zinc vaporization" (see col. 3, lines 46-48).

18. Courty teaches processes for purifying hydrogen sulfide-containing gas, wherein hydrogen sulfide is absorbed onto a mass comprising zinc oxide, alumina and a group II A metal oxide, a large proportion of the metal oxide being in the form of aluminate or silicoaluminate; then regenerating the mass by passing oxygen containing gas therethrough—i.e., processes as taught by Gupta '516 (see Courty abstract). "The metal of group II A which has given the best results is **calcium**, but **magnesium** and/or barium may also be used" (see col. 2, lines 8-10, emphasis added). In the exemplary contact materials A-F, calcium aluminate—from the combination of calcium oxide with alumina—is specifically discussed, and Courty discloses:

It has been observed that the material employed according to the invention retained during the absorption and regeneration cycles a high content of active zinc (uncombined zinc), i.e., zinc able to absorb gaseous sulfur compounds such as H₂S. It may be estimated that, in this material, the tendency of zinc oxide to combine with other oxides, leading to inactive zinc compounds, is reduced. (col. 4, lines 27-34)

Accordingly, it would have been obvious to one of ordinary skill in the art, at the time of applicant's invention, to have supplemented the zinc titanate-based sorbents of Gupta '516—remembering that in the Gupta '516 sorbents, zinc **oxide** is the **active** component, as discussed *supra*—with the alumina-group II A metal oxide materials of Courty in order to improve sulfur removal, because, as just discussed, Courty teaches that, in zinc oxide-based sorbents such materials preferentially combine, thereby

leaving zinc oxide uncombined and “able to absorb gaseous sulfur compounds such as H_2S (see again col. 4, lines 30-31; see also col. 6, lines 3-6). When having done so, it is respectfully submitted that, absent evidence otherwise, processes falling within the scope of instant claims 1, 2 and 4-13 would have obviously resulted, again noting that Courty teaches both calcium and magnesium as preferred group II A metals.

19. It is noted that instant claim 3 has **not** been included in the above 35 U.S.C. § 103(a) rejection, since zinc is not a “group II A metal”. **Moreover**, even if assumed *arguendo* that the above combination of Gupta ‘516 with Courty did render processes falling within the scope of instant claim 3 *prima facie* obvious, the data provided in the instant specification are considered **sufficient** to overcome same. In particular, Figure 5 shows that applicant's zinc titanate/**zinc** oxide-aluminate containing sorbent—versus zinc titanate/unreacted alumina containing sorbent, per Figure 1—provides improvements in reduced sulfur capturing activity after repeated high temperature, high pressure cycling that would **not** have been expected, given the prior art of record (see also the corresponding discussion in paragraph [0059] of the instant specification). **However**, it is noted that this data **cannot** be considered sufficient to overcome the *prima facie* case of obviousness established above, since “objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support” (see MPEP § 716.02(d)); that is, applicant's comparative data appear drawn to the **specific** “metal oxide-aluminate phase” **zinc** oxide-aluminate, whereas instant claims 1, 2 and 4-13 are **not** so limited.

Conclusion

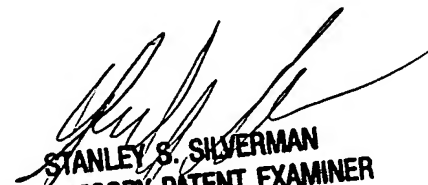
20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references are considered cumulative to or less material than those discussed above and include those cited during prosecution of parent application 09/541,204. US 4,477,592 (a division of US 4,446,013) has been cited, since discussed in column 5 of Gupta '516.

21. Any inquiry concerning this communication should be directed to Ardith E. Hertzog at 571-272-1347. The examiner can normally be reached on Monday through Friday (from about 8:00 a.m. - 4:00 p.m.).

22. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman, can be reached at 571-272-1358. **The central fax number for all communications is now 571-273-8300.**

23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. For any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


AEH
July 19, 2005


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